**Richard Paul’s description of Critical Thinking components**

*Purpose, Goal, or End in View*: Whenever we reason, we reason to some end, to achieve some objective, to satisfy some desire, or fulfill some need. One source of problems in student reasoning is traceable to defects at the level of goal, purpose, or end. If the goal is unrealistic, for example, or contradictory to other goals the student has, if it is confused or muddled in some way, the reasoning used to achieve it is problematic. If students have a limited or conflicted sense of self, their purposes are likely to be muddled and contradictory This insecurity would most likely involve the students in self-protective equivocationthat would further confuse their expression of purpose. The goal, purpose, or end of our thinking is something our mind must actively create.

*Question at Issue or Problem to be Solved:* Whenever we attempt to reason something out, there is at least one question at issue, at least one problem to be solved. One area of concern for assessing student reasoning, therefore, will be the formulation of the question to be answered or the problem to be solved, whether with respect to the student’s own reasoning, or to that of others. If we are not clear about the question we are asking, or how the question relates to our basic purpose or goal, then it is unlikely that we will be able to find a reasonable answer to it, or one that will serve our purpose. The question at issue in our thinking is something our mind must actively create.

*The Empirical Dimension of our Reasoning*: Whenever we reason there is some "stuff," some phenomena about which we are reasoning. Any defect then in the experiences, data, evidence, or raw material upon which a person’s reasoning is based is a possible source of problems. We must actively decide which of a myriad of possible experiences, data, evidence, etc. we will use.

*The Conceptual Dimension of Reasoning:* All reasoning uses some ideas or concepts and not others These concepts can include the theories, principles, axioms and rules implicit in our reasoning. Any "defect" in the concepts or ideas of the reasoning is a possible source of problems in student reasoning. The concepts and ideas that shape our mind must be actively created by us.

*Assumptions*—*The Starting Points of Reasoning*: All reasoning must begin somewhere, must take some things for granted. Any defect in the starting points of our reasoning, any problem in what we are taking for granted, is a possible source of problems. Only we can create the assumptions on the basis of which we will reason. Assessing skills of reasoning involves assessing their ability to recognize and articulate their assumptions, again according to the relevant standards. The student’s assumptions may be stated clearly or unclearly; the assumptions may be justifiable or unjustifiable, crucial or extraneous, consistent or contradictory.

*Inferences:* Reasoning proceeds by steps called inferences. To make an inference is to think as follows: "Because this is so, that also is so (or probably so)." Any defect in the inferences we make while we reason is a possible problem in our reasoning. Information, data, and situations do not determine what we shall deduce from them; we create inferences through the concepts and assumptions we bring to the situation.

*Implications and Consequences—Where Our Reasoning Takes Us*: All reasoning starts somewhere and proceeds somewhere else. No reasoning is static. Reasoning is a sequence of inferences that begin somewhere and take us somewhere else. Thus all reasoning comes to an end yet could have been taken further. All reasoning has implications or consequences beyond those the reasoner has considered. Any problem with these (implications that are false, undesirable consequences) implies a problem in our reasoning. The implications of our reasoning are an implicit creation of our reasoning. The ability to reason well is measured in part by an ability to understand and enunciate the implications and consequences of the reasoning. Students therefore need help in coming to understand both the relevant standards of reasoning out implications and the degree to which their own reasoning meets those standards.

*Point of View or Frame of Reference:* Whenever we reason, we must reason within some point of view or frame of reference. Any "defect" in that point of view or frame of reference is a possible source of problems in the reasoning. A point of view may be too narrow, too parochial, may be based on false or misleading analogies or metaphors, may contain contradictions, and so forth. The point of view which shapes and organizes our thinking is something our mind must actively create. It may be restricted or unfair. Alternatively, student reasoning involving articulation of their point of view may meet the relevant standards to a significant degree: the point of view may be broad, flexible, fair; it may be clearly stated and consistently adhered to.